AMERICAN

CHEMICAL JOURNAL

EDITED

WITH THE AID OF CHEMISTS AT HOME AND ABROAD

BY

IRA REMSEN

PROFESSOR OF CHEMISTRY IN THE JOHNS HOPKINS UNIVERSITY.

VOL. 2. 1880-81.

BALTIMORE: THE EDITOR.

ISAAC FRIEDENWALD, PRINTER,
103 W. Fayette St.

CONTENTS VOL. II.

NO. I.

PAGE.

RESEARCHES ON THE SUBSTITUTED BENZYL COMPOUNDS:
II. *The Action of Bromine on Toluol, and some of its Derivatives.* By C. Loring Jackson, ... 1

ON *α* AND *β*-MONOBROMCROTONIC ACIDS. By Arthur Michael and Lewis M. Norton, ... 11

ON A NEW SYNTHESIS OF SALIGENIN. By Wm. H. Greene, ... 19

ON THE DECOMPOSITION OF ALCOHOLS, ETC., BY ZINC CHLORIDE AT HIGH TEMPERATURES. By J. A. Le Bel and Wm. H. Greene, . . . 20

ON THE DETERMINATION OF NITROGEN. By S. W. Johnson and E. H. Jenkins, ... 27

GUM LAC FROM ARIZONA. By J. M. Stillman, ... 34

ETHEREAL OIL OF CALIFORNIA BAY TREE. By J. M. Stillman, . . 38

THE ELECTROLYTIC METHOD AS APPLIED TO CADMIUM. By Edgar F. Smith, ... 41

GALLIUM IN AMERICAN BLENDES. By H. B. Cornwall, ... 44

NITRIFICATION IN STANDARD AMMONIUM CHLORIDE SOLUTIONS. By H. B. Cornwall, ... 45

LABORATORY NOTES. By Wm. L. Dudley, ... 47

DETECTION OF HYDROCHLORIC ACID BY SULPHURIC ACID AND ACID POTASSIUM SULPHATE. By H. W. Wiley, ... 48

ON THE OXIDATION OF SUBSTITUTION PRODUCTS OF AROMATIC HYDROCARBONS:
V. *Experiments in the Para-Series.* By Ira Remsen and Lyman B. Hall, ... 50

REVIEWS AND REPORTS.

Brief Review of the most important Changes in the Industrial Applications of Chemistry within the last few Years, (continued). By J. W. Mallet, ... 62

Report on Progress in Analytical Chemistry. By H. N. Morse, . . 67

7188

NOTES.

Synthesis of Formic Acid (V. Merz and J. Tibiriça), 76. The Valence of Boron (A. Michaelis and P. Becker), 77. Artificial Alkaloids (A. Ladenburg), 77. On the new Hydrogen Lines and the Dissociation of Calcium (H. W. Vogel), 77. Chlorine, Bromine and Iodine at High Temperatures (V. Meyer and J. M. Crafts), 78.

Brevities, ... 78, 79

New Publications. 79

NO. 2.

On the Determination of Albuminoids in Hay and Coarse Fodders. By H. P. Armsby, ... 81

Researches on the Substituted Benzyl Compounds:

III. *Parachlorbenzyl Compounds.* By C. Loring Jackson and Alfred W. Field, ... 85

On the Action of Hydrochloric Acid and of Chlorine on Acetobenzoic Anhydride. By Wm. H. Greene, ... 96

On the Relative Densities of Permanent Gases at High Temperatures. By J. M. Crafts, ... 98

The Vapor Density of Iodine. By Fr. Meier and J. M. Crafts, . . 108

On the Oxidation of Substitution Products of Aromatic Hydrocarbons:

VI. *Experiments with Mesitylene.* By Lyman B. Hall and Ira Remsen, ... 130

REVIEWS AND REPORTS.

Brief Review of the most important Changes in the Industrial Applications of Chemistry within the last few Years (continued). By J. W. Mallet, ... 143

NOTES.

On the Reversal of the Direction of Rotation caused by ordinary Malic Acid by a simple Change in the Concentration (G. H. Schneider), 150. The Alkaloids (A. Ladenburg), 151. On the Gases retained by Occlusion in Aluminium and Magnesium (M. Dumas), 151. The Research Fund in England, 152.

NO. 3.

ON THE DENSITY OF THE VAPORS OF SOME AMMONIUM AND AMMONIA COMPOUNDS. By W. G. Mixter, ... 153

RESEARCHES ON THE SUBSTITUTED BENZYL COMPOUNDS:
IV. *Parachlorbenzyl Compounds.* By C. Loring Jackson and J. Fleming White, ... 158

PRELIMINARY NOTE ON THE SYNTHESIS OF METHYLCONINE AND CONSTITUTION OF CONINE. By Arthur Michael and Charles Gundelach, 171

LABORATORY NOTES FROM THE UNIVERSITY OF CINCINNATI:
XIII. *On a New Variety of Tetrahedrite.* By F. W. Clarke and Mary E. Owens, ... 173
XIV. *Specific Gravity Determinations.* By F. W. Clarke, . . 174

CONCERNING IODINE. By Victor Meyer, ... 175

ON THE DETERMINATION OF BARIUM AS CHROMATE. By H. N. Morse, . 176

ON A-TOLUENEDISULPHONIC ACID AND ITS DERIVATIVES. By C. Fahlberg, 181

REVIEWS AND REPORTS.

Report on the Progress of Analytical Chemistry (continued). By H. N. Morse, ... 199

Report on Progress in Physiological Chemistry. By R. H. Chittenden, 204

Grundriss der chemischen Technologie.—Leçons de Chimie élémentaire appliquée aux Arts industriels. By J. W. M., ... 212

Recent Publications relating to Chemistry, ... 216

NO. 4.

RESEARCHES ON THE COMPLEX INORGANIC ACIDS. By Wolcott Gibbs, . 217

ON THE DETECTION AND DETERMINATION OF ARSENIC IN ORGANIC MATTER. By R. H. Chittenden and H. H. Donaldson, . . 235

ESTIMATION OF SULPHUR IN ILLUMINATING GAS BY BURNING IN OXYGEN. By W. G. Mixter, ... 244

SYNTHESIS OF WATER FOR A LECTURE EXPERIMENT. By W. G. Mixter, 246

A TUBULATED CRUCIBLE FOR USE IN ESTIMATING VOLATILE PRODUCTS OF IGNITION. By F. A. Gooch, ... 247

RESEARCHES ON THE SUBSTITUTED BENZYL COMPOUNDS:
V. *On Paraiodbenzyl Compounds.* By C. F. Mabery, . . . 250

CHLORO-NITRO-PHENETOL. By E. J. Hallock, ... 258

REVIEWS AND REPORTS.

Brief Review of the most important Changes in the Industrial Applications of Chemistry within the last few Years, (continued). By J. W. Mallet, ... 259

Report on Progress in Physiological Chemistry, (continued). By R. H. Chittenden, ... 268

The Subsection of Chemistry at Boston. By F. W. Clarke, ... 274

NOTES.

Ozone in the Air (E. Schöne), ... 279

NO. 5.

RESEARCHES ON THE COMPLEX INORGANIC ACIDS. By Wolcott Gibbs, . 281

ESTIMATION OF ALKALOIDS BY POTASSIUM MERCURIC IODIDE. By Albert B. Prescott, ... 294

CONTRIBUTIONS FROM THE CHEMICAL LABORATORY OF HARVARD UNIVERSITY:

VI. *On the Ethers of Uric Acid: Dimethyluric Acid.* By H. B. Hill and C. F. Mabery, ... 305

VII. *Researches on the Substituted Benzyl Compounds: Orthobrombenzyl Compounds.* By C. Loring Jackson and J. Fleming White, ... 315

LABORATORY NOTES FROM THE UNIVERSITY OF CINCINNATI:

XV. *The Constitution of the Tartrates of Antimony.* By F. W. Clarke and Helena Stallo, ... 319

XVI. *On the Relative Stability of Certain Organic Salts.* By Miles Beamer and F. W. Clarke, ... 329

XVII. *Some New Salts of Uranium.* By F. W. Clarke and Mary E. Owens, ... 331

XVIII. *Graphite from Ducktown, Tennessee.* By W. L. Dudley and F. W. Clarke, ... 331

ON THE DISTRIBUTION OF ARSENIC IN THE HUMAN BODY IN A CASE OF ARSENICAL POISONING. By S. W. Johnson and R. H. Chittenden, 332

SYNTHESIS OF SALICYLIC ACID. By Edgar F. Smith, ... 338

Contents.

REVIEWS AND REPORTS.

Recent Progress in Agricultural Science. By H. P. Armsby, . . . 339
Review of Lunge's Treatise on the Manufacture of Sulphuric Acid and Alkali, ... 342
Review of Beilstein's Handbuch der organischen Chemie. . . . 346
Some Recent Investigations in Physical Chemistry, ... 347
Review of Wurtz's The Atomic Theory, ... 355

NOTES.

The Opium Alkaloids (E. v. Gerichten), 358. River Water (C. M. Tidy and E. Frankland). 358. Two Remarkable Cases of Metamerism (Ludwig Schreiner), 359. The Atomic Weight of Glucinum (Lothar Meyer), 360. On the Nature of Caucasian Petroleum (F. Beilstein and A. Kurbatow), 360.

NO. 6.

ON A SIMPLE FORM OF APPARATUS FOR DETERMINING THE SPECIFIC HEATS OF SOLIDS AND LIQUIDS WITH SMALL QUANTITIES OF MATERIAL. By J. W. Mallet, ... 361

ON JAROSITE FROM A NEW LOCALITY. By George A. König, . . . 375

ON BEEGERITE, A NEW MINERAL. By George A. König, ... 379

CONTRIBUTIONS FROM THE CHEMICAL LABORATORY OF HARVARD UNIVERSITY:

VIII. *Researches on the Substituted Benzyl Compounds: The Synthesis of Anthracene and Phenanthrene from Orthobrombenzylbromide.* By C. Loring Jackson and J. Fleming White, ... 383

CONTRIBUTIONS FROM THE SHEFFIELD LABORATORY OF YALE COLLEGE:

VIII. *On Sauer's Method of Estimating Sulphur and some Modifications.* By W. G. Mixter, ... 396

THE DETERMINATION OF SULPHUR IN SULPHIDES AND IN COAL AND COKE. By Thomas M. Drown, ... 401

ON THE OXIDATION OF SUBSTITUTION PRODUCTS OF AROMATIC HYDROCARBONS:

VII. *Sulphoterephthalic Acid.* By Ira Remsen and W. Burney, 405
VIII. *Sulphoterephthalic Acid from Paraxylenesulphonic Acid.* By Ira Remsen and M. Kuhara, ... 413

REVIEWS AND REPORTS.

Brief Review of the most important Changes in the Industrial Applications of Chemistry within the last few Years (continued). By J. W. Mallet, ... 417

Recent Progress in Agricultural Science. By H. P. Armsby, . . 426

NOTES.

Properties of Ozone (Hautefeuille and Chappuis), 433. On New Ethers of Carbonic Acid (Röse), 435. The Atomic Weight of Glucinum (Nilson), 435. Synthesis of Tropic Acid (Ladenburg and Rügheimer), 436. On the Hydrocarbons of American Petroleum (Beilstein and Kurbatow), 436. Concerning the Formula of Benzene (J. Thomsen), 437. Arsinobenzoic Acid (La Coste), 438. Baeyer's Method for the Synthesis of Indigo, 438.

Brevities, ... 439

New Publications, ... 440

INDEX VOL. II.

PAGE.

ACETIC acid, decomposition by zinc chloride . . . 26
Acetobenzoic anhydride, action of hydrochloric acid and of chlorine on . . . 96
Acetone, decomposition by zinc chloride . . . 26
Acids, complex inorganic . . . 217, 281
Albuminoids, determination of in hay and coarse fodders . . . 81
Alcohols, decomposition by zinc chloride . . . 20
Aldehyde, decomposition by zinc chloride . . . 25
Alkaloids, artificial . . . 77, 151
Alkaloids, estimation of by potassium mercuric iodide . . . 294
Aluminum, occlusion of gases in . . . 151
Ammonium and ammonia compounds, vapor density of . . . 153
Anthracene, constitution of . . . 388
Anthracene, synthesis of from orthobrombenzylbromide . . . 383
Antimony, tartrates of . . . 319
Armsby, H. P. Determination of albuminoids in hay and coarse fodders . . . 81
" " Report on agricultural science . . . 339, 426
Arsenic, detection and determination of, in organic matter . . . 235
Arsenic, distribution of in human body . . . 332
Arsenio-tungstates . . . 289
Arsinobenzoic acid . . . 438
Atomic theory (Würtz) . . . 355

BARIUM, determination of as chromate . . . 176
Barium sulphate, specific heat of . . . 374
Becker, P. See *Michaelis, A.*
Beegerite, a new mineral . . . 379
Beilstein, F., and *Kurbatow, A.* Nature of Caucasian petroleum . . . 360
" " Hydrocarbons of American petroleum . . . 436
Beilstein's law . . . 2
Benzene, formula of . . . 437
Benzyl compounds . . . 1, 85, 158, 250, 315, 383
Boron, valence of . . . 77
Brick . . . 417
Brómine at high temperatures . . . 78
Brühl, J. W. Chemical constitution of organic bodies in relation to their density and their power to transmit light . . . 352
Butyl alcohol, decomposition by zinc chloride . . . 24

CADMIUM, electrolytic estimation of . . . 41
" separation from copper . . . 42
Calcium, dissociation of . . . 77
Cane sugar, specific heat of . . . 374
Carbonic acid, ethers of . . . 435
Cements . . . 420
" hydraulic . . . 418
Chappuis. See *Hautefeuille.*
Chittenden, R. H. Report on physiological chemistry . . . 204, 268
" " and *Donaldson, H. H.* Detection and determination of arsenic in organic matter . . . 235
Chlorine at high temperatures . . . 78

PAGE.

Chloro-nitro-phenetol . . . 258
Clarke, F. W. Specific gravity determinations . . . 174
" " and *Beamer, Miles.* Relative stability of certain organic salts . . . 329
" " and *Dudley, W. L.* Graphite from Ducktown, Tenn. . . . 331
" " and *Owens, Mary E.* New salts of uranium . . . 331
" " and " " New variety of tetrahedrite . . . 173
" " and *Stallo, Helena.* Constitution of the tartrates of antimony . . . 319
Clothing, materials and processes connected with . . . 259
Conine, constitution of . . . 171
Constitution of organic bodies in relation to their density and their power to transmit light . . . 352
Copper, specific heat of . . . 374
" separation from cadmium . . . 42
Cornwall, H. B. Gallium in American blendes . . . 44
" " Nitrification in standard ammonium chloride solutions . . . 45
Crafts, J. M. Chlorine, bromine and iodine at high temperatures . . . 78
" " Relative densities of gases at high temperatures . . . 98
" " and *Meier, Fr.* Vapor density of iodine . . . 108
Crucible, tubulated, for estimating volatile products of ignition . . . 247
Cymenesulphamide, oxidation of . . . 52

DENSITIES, relative, of gases at high temperatures . . . 98
Dimethyluric acid . . . 305
Dioxybenzoic acid . . . 197
Disinfectants . . . 425
Disulphobenzoic acid . . . 188
Donaldson, H. H. See *Chittenden, R. H.*
Drown, Thomas M. Determination of sulphur in sulphides in coal and coke . . . 401
Dudley, W. L. Modification of Böttger's test for sugar . . . 47
" " See also *Clarke, F. W.*
Dumas, M. Gases retained by occlusion in aluminum and magnesium . . . 151

ETHYL alcohol, decomposition by zinc chloride . . . 22
" " specific heat of . . . 374
Explosive agents . . . 423

FAHLBERG, C. *a*-Toluenedisulphonic acid and its derivatives . . . 181
Ferric oxide, specific heat of . . . 374
Field, A. W. See *Jackson, C. L.*
Food, materials used as . . . 143
Formic acid, synthesis of . . . 76
Frankland, E. River water . . . 358

GALLIC acid, new test for . . . 48
Gallium in American blendes . . . 44
Gases, relative densities of at high temperatures . . . 98
von Gerichten, E. Opium alkaloids . . . 358
Gibbs, Wolcott. Complex inorganic acids . . . 217, 281
Glass, manufacture of . . . 62
Glucinum, atomic weight . . . 360, 435
Glue . . . 421
Gooch, F. A. Tubulated crucible for estimating volatile products of ignition . . . 247
Graphite from Ducktown, Tenn. . . . 331
Greene, W. H. Action of hydrochloric acid and of chlorine on acetobenzoic anhydride . . . 96
" " Synthesis of saligenin . . . 19
" " See also *Le Bel, J. A.*
Gum-lac from Arizona . . . 34
Gundelach, C. See *Michael, A.*

HALLOCK, E. J. Chloro-nitro-phenetol . . . 258
Handbuch der organischen Chemie (Beilstein) . . . 346

PAGE.

Hautefeuille and *Chappuis*. Properties of ozone 433
Hill, H. B., and *Mabery, C. F.* Dimethyluric acid 305
Hydrochloric acid, detection of by sulphuric acid and acid potassium chromate . . . 48
Hydrogen, new lines of 77

INIDGO, Baeyer's method for synthesis 438
Iodine at high temperatures 78
" vapor density of 108, 175
Iron, specific heat of 374
Isobutyl alcohol, decomposition by zinc chloride 23
Isoxylene, trinitro-, from American petroleum 437

JACKSON, C. L. Substituted benzyl compounds 1, 85, 158, 250, 315, 383
" and *Field, A. W.* Action of bromine on toluol 1
" " " Parachlorbenzyl compounds 85
" " *White, J. Fleming.* Parachlorbenzyl compounds 158
" " " Synthesis of anthracene and phenanthrene from orthobrombenzylbromide . . . 383
" " " Orthobrombenzyl compounds 315
Jarosite from a new locality 375
Jenkins, E. H. See *Johnson, S. W.*
Johnson, S. W., and *Chittenden, R. H.* Distribution of arsenic in human body . . . 332
" " *Jenkins, E. H.* Determination of nitrogen 27

KÖNIG, G. A. Beegerite, a new mineral 379
" " Jarosite from a new locality 375
Kurbatow. See *Beilstein.*

LA COSTE. Arsinobenzoic acid 438
Ladenburg, A. Artificial alkaloids 77, 151
" and *Rugheimer.* Synthesis of tropic acid 436
Le Bel, J. A., and *Greene, W. H.* Decomposition of alcohols, etc., by zinc chloride . . 20
Leçons de chimie élémentaire apliquée aux arts industriels (Girardin) 214
Lime-burning 418

MABERY, C. F. Paraiodbenzyl compounds 250
Magnesium, occlusion of gases in 151
Malic acid, reversal of the direction of rotation 150
Mallet, J. W. Report on industrial chemistry 62, 144, 259, 417
" Simple form of apparatus for determining specific heats 361
Meier, Fr. See *Crafts, J. M.*
Mercury, specific heat of 374
Merz, V., and *Tibiriça, J.* Synthesis of formic acid 76
Mesitylene, experiments with 130
Mesitylenesulphamide, oxidation of 131
Mesitylenic sulphinide 133
Metamerism, two remarkable cases of 359
Metastasis 426
Methyl alcohol, decomposition by zinc chloride 21
Methylconine, synthesis of 171
Methyluric acid, oxidation 311
Meyer, Lothar. Atomic weight of glucinum 360
Meyer, Victor. Chlorine, bromine and iodine at high temperatures 78
" Concerning iodine 175
Michael, A., and *Gundelach, C.* Synthesis of methylconine and constitution of conine . 171
" and *Norton, Lewis M.* α- and β- Monobromcrotonic acids 11
Michaelis, A., and *Becker, P.* Valence of boron 77
Mixter, W. G. Density of the vapors of some ammonium and ammonia compounds . . . 153
" Estimation of sulphur in illuminating gas 244
" Sauer's method of determining sulphur 396
" Synthesis of water for lecture experiment 246

PAGE.

α- and β-Monobromcrotonic acids 11
Morse, H. N. Determination of barium as chromate 177
" Report on analytical chemistry 67, 199
Mortar 418

NILSON. Atomic weight of glucinum 435
Nitrification in standard ammonium chloride solutions 45
Nitrogen, determination of 27
Norton, Lewis M. See *Michael, A.*

OIL, ethereal, of California bay-tree 38
Opium alkaloids 358
Orthobrombenzylbromide, action of sodium on 391
" synthesis of anthracene and phenanthrene from 383
Orthobrombenzyl compounds 315
Owens, Mary E. See *Clarke, F. W.*
Oxidation of substitution-products of aromatic hydrocarbons 50, 130, 405, 413
Oxytoluic acid from sulphamineparatoluic acid 54
Ozone in the air 279
Ozone, properties of 433

PAINTS, vehicles for 422
Parachlorbenzyl compounds 85, 158
Paraiodbenzyl compounds 250
Paraxylenesulphamide, oxidation of 50
Paraxylenesulphonic acid, sulphoterephthalic acid from 413
Petroleum, American 436
" Caucasian 360
Phenanthrene, constitution of 388
Phenanthrene, synthesis of from orthobrombenzylbromide 383
Phospho-tungstates 217
Pigments for house-painters' use 421
Porcelain and other clay ware, manufacture of 66
Potassium nitrate, specific heat of 374
Prescott, A. B. Estimation of aklaloids by potassium mercuric iodide 294
Propyl alcohol, decomposition by zinc chloride 23
Proteid metastasis 427
Publications, new 79, 216, 440
REMSEN, IRA. Oxidation of substitution products of aromatic hydrocarbons 50, 130, 405, 413
" " and *Burney, W.* Sulphoterephthalic acid 405
" " and *Hall, L. B.* Experiments in the para-series 50
" " and " Experiments with mesitylene 130
" " and *Kuhara, M.* Sulphoterephthalic acid from paraxylenesulphonic acid 413
Reports on agricultural science 339, 426
" analytical chemistry 67, 199
" industrial chemistry 62, 143, 259, 417
" physiological chemistry 204, 268
Research fund in England 152
Rése. New ethers of carbonic acid 435
Rügheimer. See *Ladenburg.*

SALICYLIC acid, synthesis of 338
Saligenin, new synthesis of 19
Schöne, E. Ozone in the air 279
Schneider, G. H. Reversal of the direction of rotation caused by ordinary malic acid 150
Schreiner, L. Two remarkable cases of metamerism 359
Silver, specific heat of 374
Smith, E. F. Electrolytic method applied to cadmium 41

PAGE.

Smith, E.F. Synthesis of salicylic acid 338
Specific gravity determinations 174
Specific heats, simple form of apparatus for determining 361
Stability, relative, of certain organic salts 329
Stallo, Helena. See *Clarke, F. W.*
Stillman, J. M. Ethereal oil of California bay-tree 38
" " Gum-lac from Arizona 34
Stone 417
Stucco 418
Sugar, modification of Böttger's test 47
Sulphaminebenzoic sulphinide 186
Sulphaminemesitylenic acid 139
Sulphamineparatoluic acid 51
Sulphamineuvitic acid 137
Sulphinidoterephthalic acid, amide of 410
Sulphotoluic acid 411
Sulphoterephthalic acid 56, 405
" " action of phosphorus pentachloride and ammonia on 409
" " from paraxylene sulphonic acid 413
" " salts of 406
Sulphur, determination of, in coal and coke 401
" estimation of in illuminating gas 244
" Sauer's method of estimating 396
Sulphuric acid, specific heat of 374

TEREPHTHALIC sulphinide 58
Tetrahedrite, new variety of 173
Theoretical and practical treatise on the manufacture of sulphuric acid and alkali (Lunge) 342
Thermochemical investigations on the theory of carbon compounds 347
Thomsen, J. Concerning the formula of benzene 437
" Thermochemical investigations on the theory of carbon compounds 317
Tibiriça, J. See *Merz, V.*
Tidy, C. M. River water 358
Timber, preservation of 420
Toluenedisulphamide, oxidation of 185
α-Toluenedisulphonic acid 181
Tribromopropionic acid 17
Tropic acid, synthesis of 436

URANIUM, new salts of 331
Uric acid, ethers of 305

VARNISHES 422
Vogel, H. W. Hydrogen lines and dissociation of calcium 77

WATER, river 358
Water, synthesis of for lecture experiment 246
White, J. Fleming. See *Jackson, C. L.*
Wiley, H. W. Detection of hydrochloric acid 48

ZINC chloride, decomposition of alcohols by 20